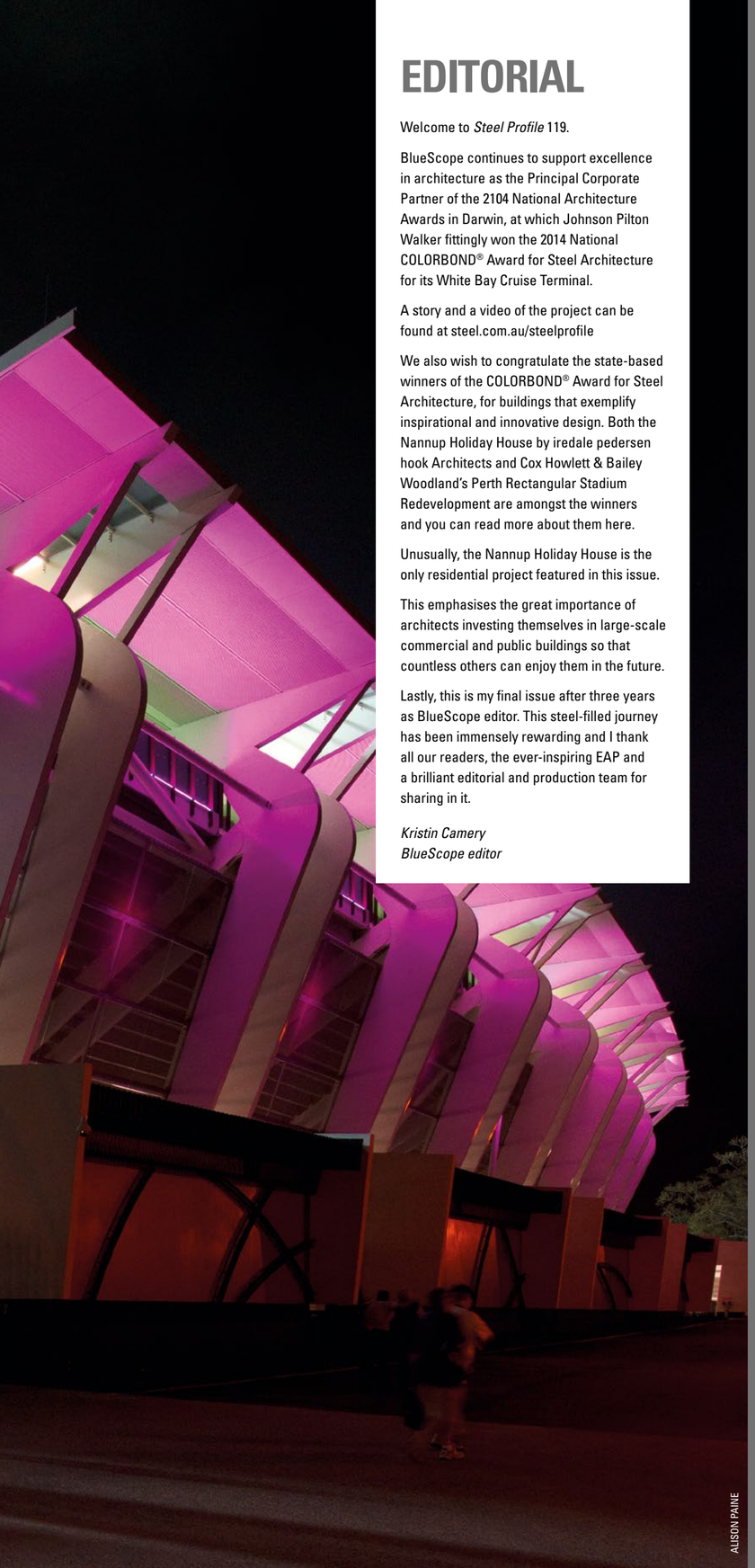
STEEL PROFILE

119
NOVEMBER 2014
ARCHITECTURAL STEEL INNOVATION
WITH BLUESCOPE

HACHEM
ECOVILLE COMMUNITY CENTRE

IRDEALE PEDERSON HOOK
NANNUP HOLIDAY HOUSE

IN PROFILE:
TROPPO ARCHITECTS


ALISON PAINE

EDITORIAL

Welcome to *Steel Profile* 119.

BlueScope continues to support excellence in architecture as the Principal Corporate Partner of the 2104 National Architecture Awards in Darwin, at which Johnson Pilton Walker fittingly won the 2014 National COLORBOND® Award for Steel Architecture for its White Bay Cruise Terminal.

A story and a video of the project can be found at steel.com.au/steelprofile

We also wish to congratulate the state-based winners of the COLORBOND® Award for Steel Architecture, for buildings that exemplify inspirational and innovative design. Both the Nannup Holiday House by iredale pedersen hook Architects and Cox Howlett & Bailey Woodland's Perth Rectangular Stadium Redevelopment are amongst the winners and you can read more about them here.

Unusually, the Nannup Holiday House is the only residential project featured in this issue.

This emphasises the great importance of architects investing themselves in large-scale commercial and public buildings so that countless others can enjoy them in the future.

Lastly, this is my final issue after three years as BlueScope editor. This steel-filled journey has been immensely rewarding and I thank all our readers, the ever-inspiring EAP and a brilliant editorial and production team for sharing in it.

Kristin Camery
BlueScope editor

EDITORIAL ADVISORY PANEL

Steel Profile has an Editorial Advisory Panel to ensure that only projects of the highest calibre are selected for publication. The panellists are:

ADAM HADDOW

Adam is a director of SJB Architects NSW. He was awarded the 40th Anniversary Churchill Fellowship in 2006 to study alternatives to conventional models of urban design. SJB Architects recently won two Australian Institute of Architects NSW Awards for Multiple Housing.

More than anything, he loves to design buildings

FRANK STANISIC

Stanisic Associates founder Frank Stanisic is a Sydney-based architect and urbanist.

His work is fuelled by an evolving interest in the diagram and frame as a basis for architectural invention, and the aesthetics of permeability.

Frank's projects have won numerous awards including Australian Institute of Architects' Special Jury, Wilkinson, Aaron Bolot and Frederick Romberg prizes

JAMES LODER

James Loder is a graduate architect working at John Wardle Architects. Graduating from RMIT with a Master of Architecture (First Class Honours) in 2012, James was awarded the 2013 BlueScope Steel Glenn Murcutt Student Prize.

His work explores the formal relationships between building and landscape with great consideration given to spatial expression and materiality

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Principal Corporate Partner

Australian Institute of Architects

COVER PROJECT
Ecoville Community Centre

PHOTOGRAPHER
Peter Hyatt

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SUBURBAN OASIS

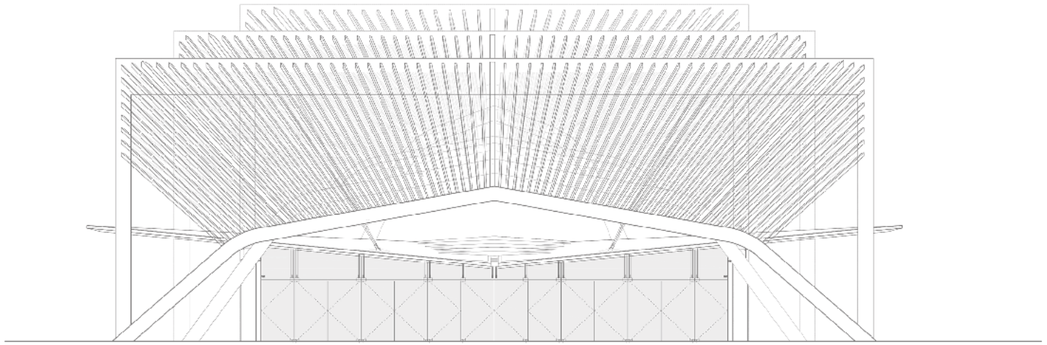
Demonstrating that supermodel looks and sharp IQ really can go together, Melbourne's Ecoville Community Centre achieves the rare double of inspired form and precise function.

Words **Peter Hyatt** Photography **Peter Hyatt; Shania Shegedyn**

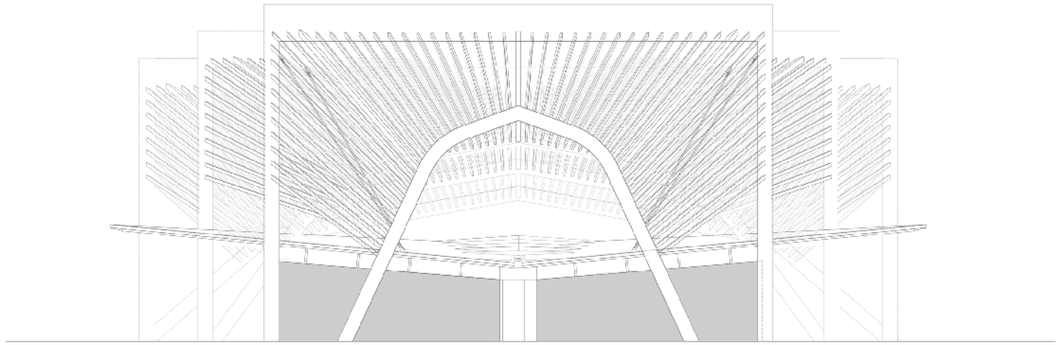
ARCHITECT
Hachem

PROJECT
Ecoville Community Centre

LOCATION
Tarneit, Victoria



NORTH ELEVATION



SOUTH ELEVATION

A wing-like geometry provides the uplifting rather than leaden. In section the floating roof appears to belong to an aircraft

PH

Prototypes aren't for the faint-hearted: especially when you're called upon as test pilot. Understandably, most clients lack the nerve to sponsor invention that breaks new ground. But most developments aren't quite this black and white.

By definition the best architecture reveals the impresario, rather than the bureaucrat. Hachem principal Fady Hachem is no stranger to proposing wild ideas and different approaches. He once tried to sell the idea of a strawberry farm to Melbourne's Dockland's Authority.

Real architecture considered from that bird's eye view – above the sprawling metropolis – is a rare sight indeed. Which is why its presence in Melbourne's unlikely sounding Ecoville is such a beacon, enough to extract a double-take from even the most casual passer-by.

Located in Tarneit, a heartland of high-revving suburban growth thirty kilometres to Melbourne's west, this community centre is intended as a kind of social glue for the state's fastest-growing municipality. In an age where citizens rarely have the luxury of time or opportunity to enjoy true neighbourliness, such projects act as a rare catalyst.

Fady knows a great deal about the role of good design for "community wellbeing and sense of neighbourhood". The project incorporates pavilion, barbeque and picnic areas, tennis courts, a large and sheltered amphitheatre, and a children's playground. And while this might sound fairly pro forma, it is the way in which the architects have responded – not with quaint, common garden variety gestures but an all-too-rare bravado – that challenges visitors, yet also welcomes them.

Steel ribbons made from RHS profile and universal beam sections and plate create a diaphanous, cloud-like structure. Echoing the wires of a piano, or strings of a harpsichord, the project's roof casts a striated pattern across its amphitheatre floor in a way that is unfamiliar to typical new estates.

Fady's design appears highly organic and fluid, and yet it's all underwritten with honest rigour that's apparent in the centre's rhythmic steel sweep and flowing grid. The design is legible and clear, and even if such modernity isn't to everyone's taste he says that "at least it's recognisable and you understand how it comes together and stands up".

The early reaction from council, Fady recalls, was a big 'No'. "Their argument was that they couldn't benchmark it against anything else. My response was: 'Well, let this be the benchmark. Let this set a new benchmark and others will reference it.' That seemed to strike a chord."

With his project Fady has steered a course considerate of providing not only amenity for people but to stimulate their curiosity. "We asked the question: 'How could it help the community?'

PANEL SAYS

The elegance of this structure is almost fabric-like – a canopy made up of a series of fine threads on a loom – which defines an inviting outdoor space. The canopy acts as a development anchor and investment in infrastructure that precedes a new suburb, and the entire project demonstrates deft resolution. We admire the slender battens that immerse the amphitheatre in a strong pattern of sunlight and the fine details – in the junctions between column and beam, and between canopy and café, for example – but the great strength of this project is in the quality of the public space it creates

"I'd like to think there is an almost spiritual feeling stepping into that space, as if visitors are released and opened to the elements"

That was our starting point," Fady explains. "New estates tend to be isolating. There's no instant community and little infrastructure, so these centres can really provide the necessary community hub.

"We took a chance. We could have met expectations with an entirely predictable result, but why bother?" he adds. The answer is self-evident and Fady smiles as he reviews a solution that arrives like a cool change on a day of unbearable heat. His answer – in a flat, sometimes hostile landscape with few mature trees – is oasis-like.

That Fady found traction for his idea in a market that is so resistant to variation is remarkable. Even then, enthusiasm from developer client Resimax wasn't immediate, Fady recalls.

"It was innovative and different but we had a client who finally saw the benefits of our proposal," he says. "It took 12 months to convince their MD Aziz Kheir," Fady says. "Then, he stood alone and really it wasn't until much later that his leadership group came around and heaped praise on the achievement. Aziz believed in this great centrepiece. It's to his credit because he had to work hard to convince his fellow directors to take a different approach."

Despite support for the community centre, the Hachem team was less successful at influencing design for any of the 300-plus new houses that form the wider estate. Fady recalls his director of architecture, Brendan Shannon, was particularly disappointed.

TOP: A precise rhythm of steel as veiled enclosure creates a shifting, cross-hatched, perspective

ABOVE: Safe play areas with easy adult supervision are a result of legible, thoughtful transparency

While the canopy boasts a bold and dynamic form, it was a fundamentally simple structure, with the potential achilles heel being the assembly joints and connections

"They are mostly standard brick and tile and do not echo the Community Centre's innovation," Shannon laments. "Too many community facilities in estates are low-grade structures. We didn't want to repeat any of those. Just because a lot of the new houses are fairly basic doesn't mean you have to design down to that level."

While the canopy boasts a bold and dynamic form, it was a fundamentally simple structure, with the potential achilles heel being the assembly joints and connections. Fady believes that the potential for error with such fabrication and construction tends to make many building professionals uncomfortable.

"Our early conversation had to explain it in the simplest, clearest possible manner," Fady says. "The builder has to understand the concept before they can build anything," he says, admitting that while this might sound all too obvious, it's vital a builder is conversant in the critical differences between creating with brick and steelwork. "It's a whole other language and skill-set," he adds.

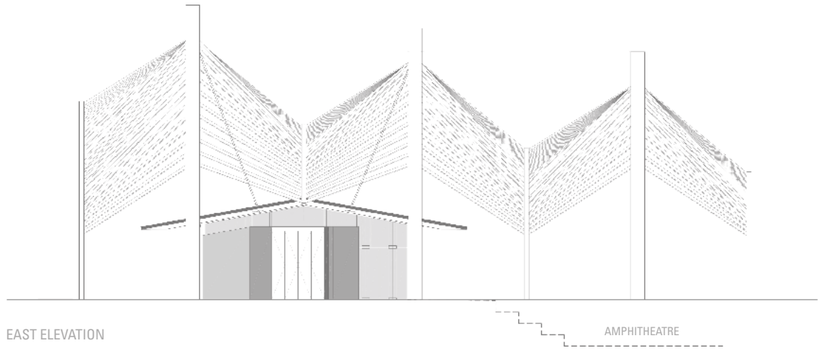
Originally designed with a floating concrete roof, the architects finally settled on steel – a decision that Fady believes was "a much better choice". "It's really gorgeous," he enthuses. "It's a raw structure that we love, and it's in parkland which actually softens it off a little.

"Our initial design was less bulky, but the engineer's first attempt resulted in a much bulkier appearance," he continues. "We kept negotiating with the engineer to see how slender and refined it could become. One of the biggest challenges was to reduce the size of the steel purlins and refine these to such a point that they seem hardly to exist."

Such fine profiling can realistically be achieved only with steel and Fady explains that pre-fabrication helped immensely, enabling parts to arrive on site to very tight tolerances, ready for assembly. Modelling of each and every part was managed in-house with Revit and 3D drawing. Rather than the ubiquitous shade cloth, the ribboned steel purlins require low-maintenance but offer far greater permanence.

"What we learned here was that the steel supplier and builder aren't necessarily on the same page," he says. "The steel manufacturer was very in tune with the issues and we still discovered some of those issues a little late. We learned a lot about the

steelwork details such as the cleat connections that must come from hand sketches rather than problem-solving everything on computer with CAD.



EAST ELEVATION

TOP: The main entrance to the southern side fans to generous meeting spaces. The sensation of patterned shadow is continued throughout and, much like a sun-dial, acts as a reminder of the time of day and the importance of light

ABOVE: Steel and glass form the essential vocabulary that deliciously contradict the brick and tile

"The angles of each of those purlin ends and cleated connections meant there was almost no margin for error," he adds. "Because the design fans out in plan, a lot of refinement and care was required to make sure we retained that precise accuracy. Had we miscalculated, the effect would be obvious and the result terrible. Because a beautiful symmetry is achieved, it sings.

"The project's striated shade quality is a definite feature and reason that functionality helped to sell the project. If you go in and argue the case purely on aesthetics you can end up in trouble. Here, we could convince the client of practical performance and function."

And then there is the light-filled quality of the building itself, which is all about material reduction. "Its light-filled component is the most impressive aspect," Fady asserts. "Although there are walls and roof, you look right through the building." This is exemplified in the bathroom, for instance, where walls are just over two metres high and then glass takes over to the floating roof.

Despite the project's undeniable appeal, Fady says in an ideal world he would have pushed himself, his client and construction team even harder. "I wanted it even lighter and thinner and even more airy, as if it came from cloth," he says. "You have to accept that there are compromises and cost pressures, but overall I'm pretty satisfied with what we've achieved.

"My wife might privately be a fan of my work, but more often she is quite critical," he laughs. "But she describes the project as inspiring. I'd like to think there is an almost a spiritual feeling stepping into that space, as if visitors are released and opened to the elements."

Hachem and the Ecoville project proves that – even in the most unlikely of settings – design can have a colossal gravity beyond its modest size and weight. SP

PROJECT Ecoville Community Centre, Melbourne **CLIENT** Resimax Group **ARCHITECT** Hachem **PROJECT TEAM** Fady Hachem, Brendan Shannon **STRUCTURAL AND CIVIL ENGINEER** Dome Consulting **BUILDER** Behmer & Wright **PROJECT MANAGERS** Trevor Main Group **STEEL FABRICATOR** P&T Weldings **SHOP DRAWING CONTRACTOR** P&T Weldings **LANDSCAPE ARCHITECTS** Landarche **PRINCIPAL STEEL COMPONENTS** RHS profiles were used as the purlin component to the shade structure, providing shade and collectively providing lateral support for the portals. Alternate portals and plates were fabricated from BlueScope steel. The roof was similarly framed with universal beam sections with a secondary frame of BlueScope cold-formed Z and C sections. Universal beams were trimmed with a 300 PFC, with 100x50x4 RHS tubular outriggers framing the taper to the edge of the roof. BlueScope flat plate steel cleats provided the fixing points from which the roof was hung **PROJECT TIMEFRAME** Two years **BUILDING SIZE** Total park = 6380m²; Civic area = 1450m² **TOTAL PROJECT COST** $4,500,000

COMPELLING NARRATIVE

This house on the edge of a forest by iredale pedersen hook Architects brings together many narratives about places, buildings and sustainable design.

Words **Alex Taylor** Photography **Peter Bennetts**

ARCHITECT
iredale pedersen hook Architects

PROJECT
Nannup Holiday House

LOCATION
Nannup, Western Australia

The house is elevated above a floodplain on slender stilts and is accessed via two 20 metre-long steel mesh ramps

All houses have a story about their making. Some have a couple. This house by iredale pedersen hook Architects (iph), however, weaves together the stories of at least three different journeys. Meandering journeys from cities, through forests, to this house, which was designed to represent a continuation of that path. Deliberate, thoughtful journeys through a series of elevated houses by architect Adrian Iredale. And lastly, the journey towards holistic sustainability, where green design attributes are completely integrated with the architecture.

The house was the dream of a Perth-based couple who had two primary school-aged sons and bought the 47-hectare site in 2009 – subdivided from an adjacent farm – with the intention of building a retreat from city life. They engaged Adrian Iredale of iph Architects to design it after admiring his Gidgegannup House in *Steel Profile* 103.

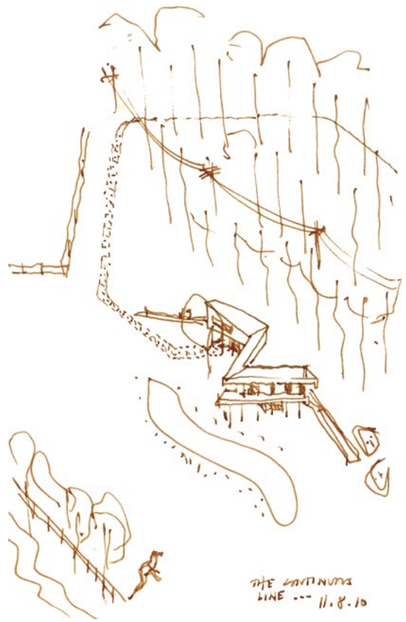
According to Iredale, they liked the simplicity of that earlier COLORBOND® steel-clad V-shaped form, perched above and looking out over rolling scenery. "They really liked Gidgegannup because it was on a similarly wooded site to theirs at Nannup, and they liked the idea of building a holiday house with a similar quality," Iredale recalls. "Their site at Nannup is fantastic, and they wanted to make the most of experiencing it, in terms of having a really strong and secluded quality.

"To me, this project offered a chance to continue exploring the elevated house type, as part of the series that started in 2000 with my parents' house at Dawesville," he says.

Whereas Gidgegannup is located 40 kilometres north-east of Perth, Nannup is 270 kilometres south, and the journey by car takes about three-and-a-half hours: a factor that inspired Iredale from the outset. "We saw the experience as being not just about this site, but about travelling to Nannup, which is inland – not coastal – so you drive through forests, meandering and zig-zagging around," Iredale says. "You drive through the town itself, then zig-zag a bit more until you reach the site. So to me, part of the experience of being on holiday there is the collection of experiences along the way."

The resulting house – wrapped entirely in LYSAGHT TRIMDEK® and LYSAGHT CUSTOM ORB® profiles made from COLORBOND® steel in the colour Monument® – unfolds as an extension of that zig-zagging expedition.

Accessed via a 20-metre-long ramp that gently ascends to the front door, one enters a dark and moody hallway, passing guest quarters and a drying deck on the left, with views over the floodplain to the right. The plan cranks 45 degrees, and the hallway – now on the right – provides views of the forest and access to a study and bedrooms on the left. It terminates in the main 'elbow' where a covered deck with glass balustrade provides a deliberately ambiguous indoor/outdoor room from which to enjoy the view, protected from western sun and prevailing winds.



The plan then cranks by another 45 degrees, eschewing hallways altogether for the open plan living/dining/kitchen room, beyond which is the master suite.

Outside, the deck gives way to a narrow balcony that hugs the southern elevation like a ribbon, terminating abruptly in yet another turn – this time a 90-degree switch to the right – returning to the ground plane via another 20 metre-long ramp.

Much of the house was constructed using steel, which was chosen for its ability to withstand fire and flood, among other reasons. "For the structure, we used an off-the-shelf system of basic steel tubes with an off-the-shelf head connector that could be screwed on site, to get the right height for the RHS beams to come in at," Iredale says. "For ease of delivery and construction, we used off-the-shelf products such as Webforge B255MP mesh for the balustrade and floor of the ramps, weathering steel for the sunshades, and galvanised steel tube for the external handrails, because these steel products gave us a lot of opportunity to prefabricate. That helped to minimise construction time on site and the risk of potential damage to the site, and offered the durability and low maintenance that we wanted for the future."

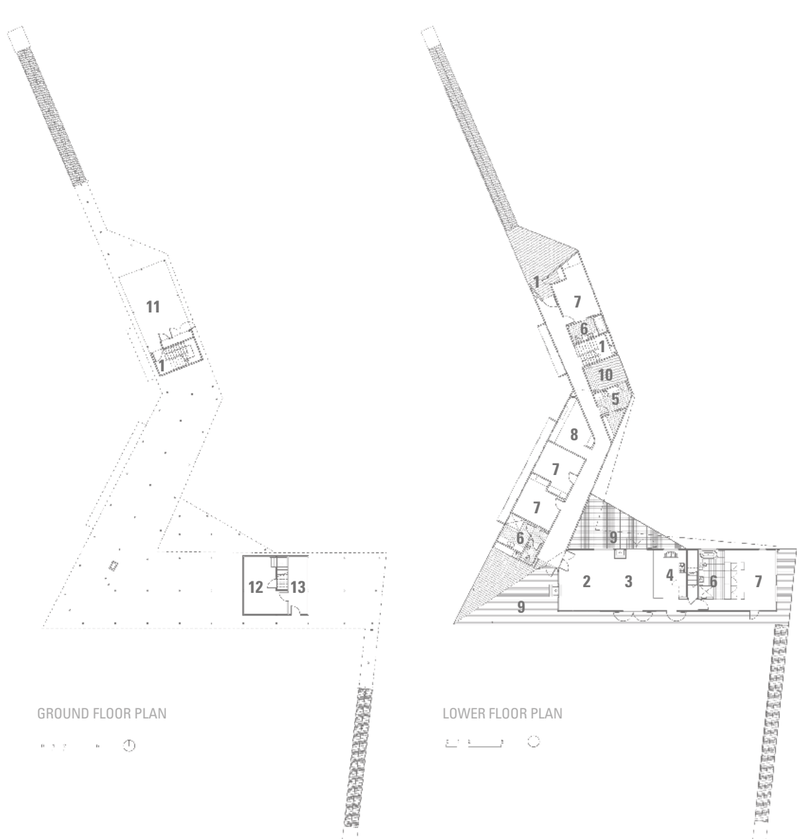
The steel colours were carefully considered: all of the building's horizontal elements – ramps, sunshades and handrails made from weathering and galvanised steel – reference the red dirt of the ground, while the vertical elements – columns and cladding, in the COLORBOND® colour Monument® – blend into the forest, allowing the house to read as a shadow in the landscape from a distance.

The dark cladding also performs a functional role by absorbing and retaining heat. "People are usually fearful of using these dark colours for all-over cladding because of the potential for heat build-up, but we wanted to capture that quality in this cool climate," Iredale says. "In this environment, Monument® performs well in terms of sustainable design."

Iredale opted to take the dark-coloured steel inside as well, where internal balustrades and handrails are made of black mild steel, treated with a Danish wax finish to prevent oxidisation. "There is a synergy between the use of steel outside and inside," he says. "Externally the steel is allowed to weather, but internally it's maintained in its raw state."

"These steel products gave us a lot of opportunity to prefabricate. That helped to minimise construction time on site and the risk of potential damage to the site"

"The form is a zig-zag as a way of experiencing the different qualities of the site, of capturing the site in a new way"



GROUND FLOOR PLAN

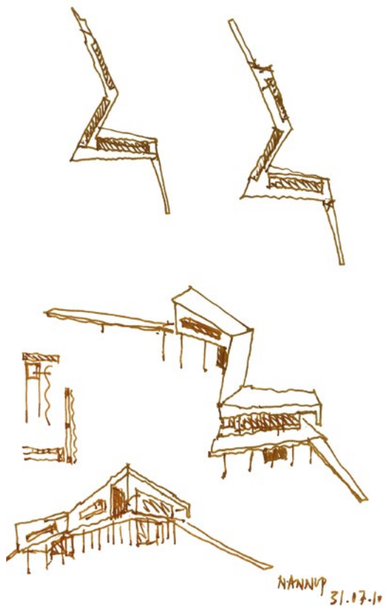
LOWER FLOOR PLAN

ABOVE: Iredale deliberately used the COLORBOND® colour Monument® to blur vertical elements into the forest behind, and weathering steel in horizontal elements, to blend with the earth

LEGEND

1. Entry
2. Living
3. Dining
4. Kitchen
5. Laundry
6. Bathroom
7. Bedroom
8. Study/Office
9. Outdoor living
10. Drying deck
11. Carport
12. Cellar/Fire shelter
13. Wood store

ABOVE: The house occupies the transitional zone between forest and floodplain, and Iredale combined extensive use of steel with recycled jarrah to reflect those surroundings



In a nod to the home's location on the edge of a significant tract of forest, Iredale used recycled jarrah on surfaces where people are likely to make contact – such as on the exterior decks – and where the skin of the COLORBOND® steel has been revealed in the elevations. "Nannup is a timber town with a history of forestry and logging, so we wanted to maintain that connection too," he explains.

Reflecting on the development of this dwelling as the latest iteration in Iredale's series of elevated houses, this zig-zag plan demonstrates the architect's growing maturity and confidence. The consideration of prospect and refuge from so many vantage points and angles in the cranked plan provides the occupants with total immersion in this unique and varied landscape.

"The form is a zig-zag as a way of experiencing the different qualities of the site; of capturing the site in a new way," Iredale says. "The house sits on a fragile line between forest and floodplain, and one side looks back towards the trees while the other side looks out towards the undulating hills on the horizon."

Iredale's manipulation of ceiling heights, roof treatments and internal mood all add to that rich atmosphere. "The section of the building undulates in response to the forest behind, creating a hierarchy of spaces within," Iredale says. "The high point is on the deck, which contrasts with the experience of lying in bed, where the roof folds down to frame a magical view of the forest. Every room has a different experience because of the section which creates great spatial variety, and there is a duality or 'Jekyll and Hyde' quality in the spaces too, thanks to the contrast of dark and light."

From a green design perspective, the house builds on ideas the architect first explored at Dawesville 15 years earlier, where bolt-on green technologies complement passive solar design principles. Dawesville boasts photovoltaic solar energy, stormwater reticulation to feed the native garden under the house during rain, and gravity-fed recycling of laundry water for the garden. Iredale is proud of those achievements, which pushed sustainable design further than typical projects at that time. "The house won the 2002 Australian Institute of Architects WA Chapter Energy Conservation Award, and it was also audited by the government to determine if the ESD (ecologically sustainable development) attributes could be improved. The answer was no," he says.

At Nannup, the house seamlessly integrates green design attributes such as natural light and cross-ventilation in every room, thanks to the careful placement of windows and doors on opposite sides of the skinny plan. The long-form roof is used to great effect to maximise water collection, which is stored in large tanks beneath the house. These also play a role in the approach sequence, concealing and then revealing the ground floor entrance and cars parked in the carport. A grey water recycling system treats water for irrigation, while the solar hot water (with back-up instantaneous gas) is located close to areas of water use to minimise waste.

Photovoltaic cells produce sufficient energy – over the course of a year – to easily cover consumption requirements, which are minimised thanks to the

SECTION

BELOW AND ABOVE RIGHT: The main deck at the elbow of the plan is protected from the elements but still provides a connection to the landscape

installation of energy-efficient equipment and a combination of LED and compact fluorescent globes.

And site disturbances were kept to a minimum by quarrying gravel and sand from the site for the dual-purpose access road and firebreak, then replanting those areas – and the undercroft – with local and indigenous species.

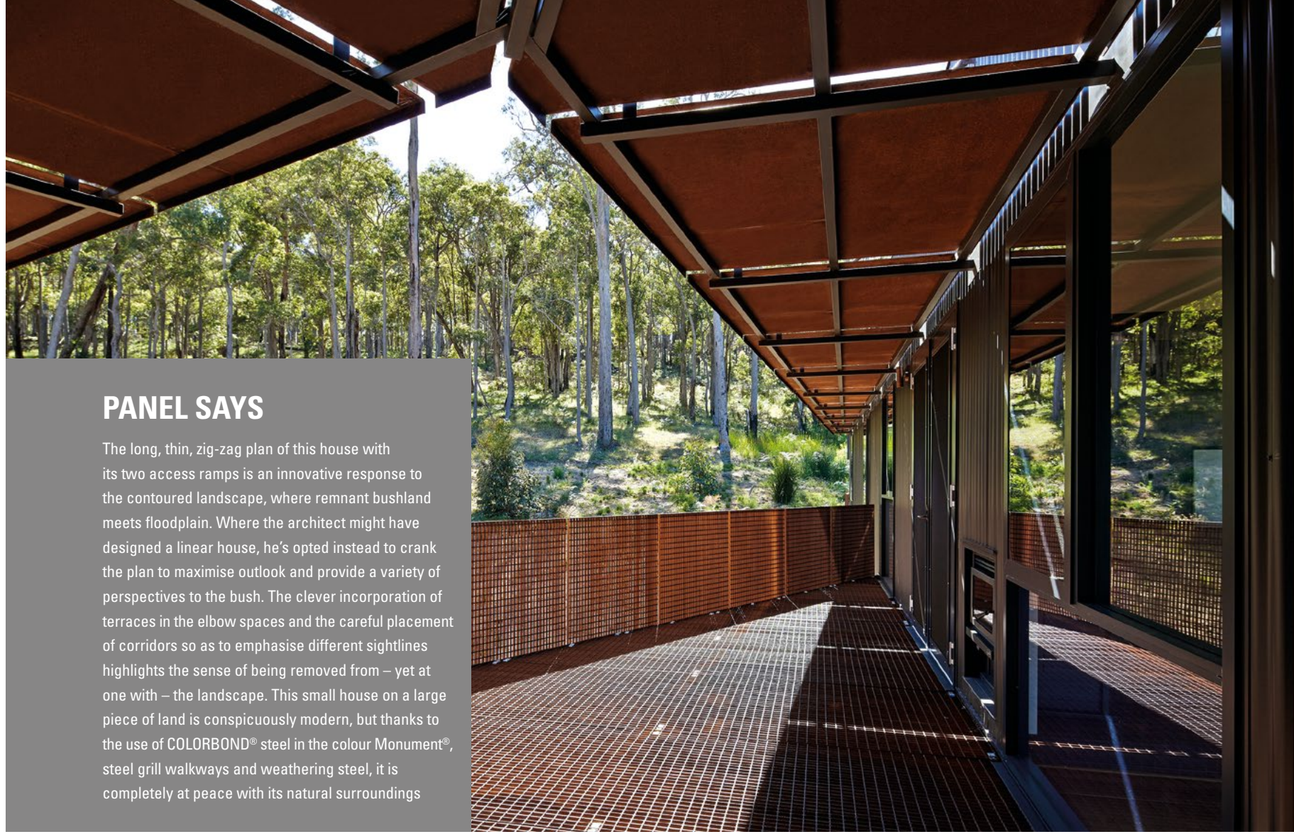
Iredale notes that a point of difference between the Dawesville and Nannup projects is his expanded definition of sustainability. "Now I would extend the concept of ecologically sustainable development to include a sense of intimacy with and respect for the landscape," he says. "To me, the notion of experiencing landscape takes on physical and emotional components now that I wasn't necessarily aware of when I was younger."

The total mastery of this design was recognised at the 2014 Australian Institute of Architects' WA Chapter Awards, with the project collecting the Marshall Clifton Award – the state's highest honour for housing. It's the second time iph has been awarded that accolade, following the win for Florida Beach House in 2011 (see *Steel Profile* 111).

The Jury said of Nannup: "Floating lightly over the landscape on slender stilts, the house forms part of a meandering path through the landscape. Its grated steel access ramps, cranked linear plan and carefully choreographed sequence of spaces and views provide protection, shelter and an intimate appreciation of environment. The use of robust agricultural materials, simple detailing and a practical approach to the provision of basic utilities provide a home that is confident, unpretentious, functional, sustainable and very much in harmony with the raw natural and pioneer spirit of the south-west."

From the outset, the clients intended that this holiday house might one day become a second home, allowing them to eventually split their time between the city and the country, Iredale recalls. "They wanted a level of comfort so they could visit for long periods of time, and so guests could come and still maintain a sense of privacy," he explains. "We also included a study so that they could work there, over the longer term."

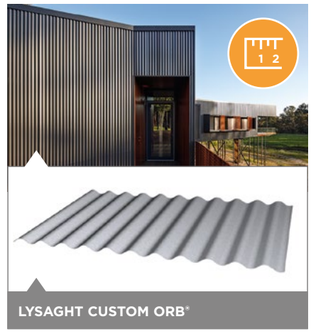
From its conception and throughout the design and construction phase, the project deliberately and carefully entwined many different threads, drawing on distinctive journeys and previous experiences to create a richly layered whole. Now that it is complete, the considered elements of this multi-faceted design allow the house to blend into its landscape and become a backdrop for new and different stories – anecdotes about family holidays, getaways with friends, or even, potentially, new chapters arising from a tree-change transformation. So on one hand, this story is complete, but on the other, it's only just beginning… SP



PANEL SAYS

The long, thin, zig-zag plan of this house with its two access ramps is an innovative response to the contoured landscape, where remnant bushland meets floodplain. Where the architect might have designed a linear house, he's opted instead to crank the plan to maximise outlook and provide a variety of perspectives to the bush. The clever incorporation of terraces in the elbow spaces and the careful placement of corridors so as to emphasise different sightlines highlights the sense of being removed from – yet at one with – the landscape. This small house on a large piece of land is conspicuously modern, but thanks to the use of COLORBOND® steel in the colour Monument®, steel grill walkways and weathering steel, it is completely at peace with its natural surroundings

ABOVE: A contrast between dark and light treatments internally creates a Jekyll and Hyde atmosphere, which shifts the focus of attention from interiors to landscape



CAD files, textures, technical drawings and product brochures are available at **steel.com.au/steelprofile**

PROJECT Nannup Holiday House **ARCHITECT** iredale pedersen hook Architects **PROJECT TEAM** Adrian Iredale, Finn Pedersen, Martyn Hook, Drew Penhale, Caroline Di Costa, Jason Lenard, Matthew Fletcher **STRUCTURAL & CIVIL ENGINEER** Paul Terpkos, Terpkos Engineering **BUILDER** Brolga Developments and Construction **STEEL FABRICATOR** Fred Glen, CCR Group **SHOP DRAWING CONTRACTOR** Kim Martin **CLADDING CONTRACTOR** Brolga Constructions **PRINCIPAL STEEL DETAILS** Roofing: LYSAGHT TRIMDEK® profile made from COLORBOND® steel in the colour Monument®. Wall Cladding and Soffit: LYSAGHT CUSTOM ORB® profile made from COLORBOND® steel in the colour Monument®. Gutters and flashings: made from COLORBOND® steel in the colour Monument®. Structural Sections: made from BlueScope Steel and all other galvanised by Hartway Galvanisers) including 75 x 75 x 5 EA; 89 x 89 x 2 SHS; 150 x 100 x 5 RHS; 150 x 50 x 3 RHS; 75 x 50 x 3 RHS; 100 x 75 x 6 UE; 50 x 50 x 6 EA; 150 PFC; 310UB40; DN25 standard weight pipe. Various other fittings, brackets, etc. supplied by OneSteel. Balustrade and floor to ramps: Webforge B255MP mesh supplied by Weldlok (Nepean Industries). Sunshades: 3mm thick steel from Unique Metals. External handrails: Galvanised steel tube 38OD hot dipped galvanised steel tube; Internal balustrades and handrails: 245x6mm black mild steel flat bar with Danish wax finish **PROJECT TIMEFRAME** Design 2010, construction 2011-2013 **AWARDS** 2014 WA Chapter Australian Institute of Architects Awards – Residential Architecture – Houses: The Marshall Clifton Award for Residential Architecture, and COLORBOND® Award For Steel Architecture – Commendation. Architectural Review (AR) House Award 2014: Honourable Mention. Australian Steel Institute Western Australia Steel Excellence Awards 2014 – Winner – Building for small projects. 2014 Interior Design Excellence Awards (IDEA) – shortlisted (announced 21 Nov 2014). WAN House of the Year Awards 2014 – Shortlisted (at the time of publication) **BUILDING SIZE** 500m²

SHANE REID

PHIL HARRIS & ADRIAN WELKE

Since its inception in Darwin in 1981, Troppo Architects has pushed boundaries and agitated for change. So it's no surprise to learn that this year's BlueScope-sponsored Australian Institute of Architects Gold Medallists – co-founders Phil Harris and Adrian Welke – are concerned about regulations that actively hinder their common-sense approach.

Words **Rachael Bernstone**

TOM WOODHOUSE

TROPPO ARCHITECTS

TROPPO ARCHITECTS

TOP AND BOTTOM LEFT: Troppo's commitment to a shelter typology that embraced openness is evident in the firm's earliest projects, such as the 'Green Can' at Karama, which won a low cost housing competition in 1982

As friends at university, Phil Harris and Adrian Welke didn't follow the prescribed path. In late 1977, when fourth year students were supposed to gain internships at established firms, they drove around the country in a Kombi-van for four months with fellow students Justin Hill and Jim Hayter. Back at university, they produced a report – self-published on recycled newsprint and sold for 50 cents a copy – about their travels. *Influences in Regional Architecture* described variations and themes in vernacular buildings, taking in a broad sweep from Esperance to Innisfail, with chapters about Western Australia's goldfields, Pilbara and Kimberley regions, as well as the Top End and north Queensland.

After graduation, Welke set off once more for Darwin. He then encouraged Harris to leave his unpaid job in Adelaide and return to the city they'd found to be the most intriguing on their travels.

While working at the same local firm, the pair won a $2000 history grant to document Top End housing. They established their own office just off Darwin's Smith Street Mall and completed a second report. *Punkahs and Pith Helmets: good principles of tropical house design* examined in more detail the early shelters built by local indigenous people, huts built by Macassan fisherman for drying trepang on the Arnhem Land coast, and a group of houses on Darwin's Myilly Point, designed by Beni Burnett in the late 1930s.

"In addition, the steel industry is wonderfully organised and competent, which offers the means of quickly getting the bones of a building up – there is a cost-effectiveness, speed and orderliness in terms of getting more complex things built"

With one house commission to their name, they launched Troppo Architects in February 1981. Eschewing the Institute's eponymous naming protocol, they instead chose a term that conjured up images of people gone mad as a result of the oppressive heat and humidity of the build-up, which is relieved only by the drenching rains of the monsoon.

Their focus on designing for weather patterns and climatic conditions set their work apart from the outset, and led to the development of an identifiable 'Troppo' quality. It's evident in their earliest works – such as the Green Can, one of 11 winners of a Low Cost House competition (built at Karama in 1982) and the Kaiplinger House (Coconut Grove, 1983) – and the practice's latest award-winning project, the Strohmayr House, winner of the Tracy Memorial Award and an Award for Residential Architecture – Houses (Alterations and Additions) at the Northern Territory Australian Institute of Architects Awards in 2014.

These houses are all the more striking when one considers the incongruous project homes built in Darwin over the course of Troppo's lifetime. After Cyclone Tracy nearly destroyed the city's northern suburbs in 1974, the new houses were mostly ground-huggers, built from in-situ or precast concrete panels, featuring small window openings and screw-fixed metal roofs. The real crime here though is how poorly those houses perform in the tropics, and how they force their occupants to rely on air-conditioning to maintain comfort in the build-up and wet seasons.

By contrast, Troppo houses are mostly elevated, open to the breezes with louvred walls and windows, protected from heat and rain by external window shades and wide verandahs, and covered by large curved steel roofs. They are characterised by an economy and robustness of materials that reflect the remote location, but they also maximise efficiency and minimise waste.

"We tried to get the Institute to award [the Gold Medal] to Troppo Architects, not just Phil and I, because the contribution that the whole collective of 100 or more people have made is not only important, but inspiring for us to see," Welke says. "We have always worked collaboratively and collectively, and when we were in Darwin young people were the only ones we could attract to go up there: graduates were keen to come up and get involved. They have been the mainstay of the practice. Some have stayed with us and others have gone on to set up their own firms."

Harris attributes their enthusiasm for nurturing the careers of young architects to the pair's own relative youth when they established the practice 33 years ago. "We started young," he explains. "We each had less than a year of work experience after graduation, so we like taking on graduates who might have an empathy for Troppo. We enjoy watching them evolve, and there's a freshness and invigoration


TROPPO ARCHITECTS


TROPPO ARCHITECTS

RIGHT AND FAR RIGHT:
The Kaiplinger House at Coconut Grove features curved steel roofs that became synonymous with Troppo's elegantly detailed use of robust and efficient materials

BELOW FROM LEFT TO RIGHT:
Recent additions to the Strohmayr House won Troppo the Tracy Memorial Award and an Award for Residential Architecture in 2014


PATRICK BINGHAM-HALL

that youth brings to any practice: and in any case, we are all on learning curves."

To emphasise this point he relates the story of their first meeting with esteemed architect Glenn Murcutt. "Glenn was about 48 then and as he wandered past our office in Darwin he noticed a mobile that we'd made out of an article about him in a newspaper, which was hanging in the front window," Harris recalls. "We went off for a beer, and Glenn said: 'of course you won't be an architect's backside until you're 40', and now that he's older he might say older, still. I suspect that's how it goes. We all keep learning and evolving and hopefully getting better: we see that hope in everyone."

Having found success in the Top End, the practice established satellite offices in Townsville and later Byron Bay, and Harris returned to Adelaide in 2000 and Welke moved to Fremantle in 2003, giving Troppo Architects a broader geographical and climatic range. Supported by teams in the five offices, the founders still work on projects in the Top End and remote indigenous communities in Western Australia, South Australia and central Australia, but they now produce buildings in capital cities and rural locations around Australia as well.

In spite of this expanded scope, there is still an unmistakeable 'Troppo-ness' to all their projects, but it's much more subtle and rooted in history and research than a signature style might be. "There is an identifiable thing called Troppo, and it's the way in which the buildings respond to their setting," says Welke.

"We like to think there's an honesty, a straightforwardness and a humble selection of materials," Harris explains. "But first and foremost we are dealing with shelter. It's not about show – it's about making something work for the climate and the place in which we are building."

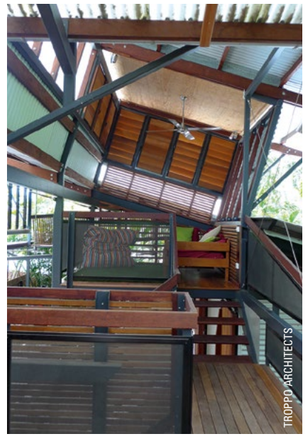
> The jury said the pair "…pioneered a unique approach to Australian architecture: irreverent but sophisticated, inventive with a tinge of larrikin spirit…"

From the outset, steel has played a pivotal role in achieving their objectives because it allowed them to experiment in an efficient and economic way. "If you go back to the Green Can and other early buildings, the whole objective was to achieve openness – the ability to play with large openings – so they relied upon a post-and-beam structure that was influenced by Japanese house principles," Welke explains. "We liked the simplicity and lightness of steel, and that strength and lightness have been central components of our structural steel frames."

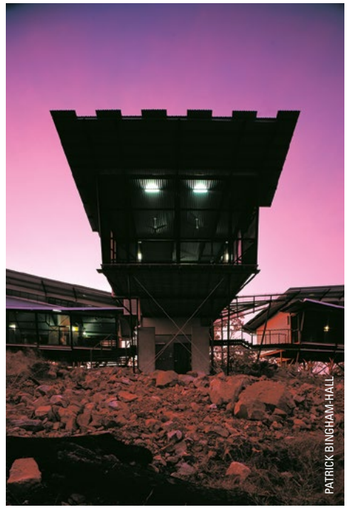
The same method is equally valid in southern locations, where the climate offers the opportunity for more glazing than in the tropics, Harris adds. "Working down south, there is a similar requirement for a neatly carried out framing system, and steel is also excellent for achieving large cantilevers, such as roofs for shading purposes.

"In addition, the steel industry is wonderfully organised and competent, which offers the means of quickly getting the bones of a building up – there is a cost-effectiveness, speed and orderliness in terms of getting more complex things built," Harris says.


TROPPO ARCHITECTS


TROPPO ARCHITECTS


TROPPO ARCHITECTS


PATRICK BINGHAM-HALL

TOP AND ABOVE: Troppo's Rozak House at Lake Bennett, south of Darwin, graced the cover of *Steel Profile* 78 and won multiple awards in 2002

The Rozak House is a case in point. Located south of Darwin, it typifies the firm's ethos of providing maximum shelter with minimum effort, using ZINCALUME® steel for wall and roof cladding, and galvanised steel framing to perch above the landscape. It won several Australian Institute of Architecture awards in 2002: including a Sustainable Architecture Award and Commendation in the Housing category at the National awards, and the NT's Sustainable Architecture prize and Burnett Award for housing.

Having played such an instrumental role in the profession – the jury said the pair "pioneered a unique approach to Australian architecture: irreverent but sophisticated, inventive with a tinge of larrikin spirit" – and having built up a deep knowledge of what works best in different places (cities versus remote locations, tropical versus arid climates, single family homes in the suburbs versus employee housing on indigenous communities) Welke and Harris admit to feeling disenchanted by the current regulatory environment that stifles the sort of innovation they've become famous for.

"Ever since the building code introduced energy efficiency measures and created the star-rating requirements for housing, that has been a real problem for us in the tropics," Welke says. "It was counter to what you needed – the idea of creating an insulated box – when actually you can get by with shade and air movement in the daytime, and a way of dispersing the heat at night.

"The more strict the building code has become, the less likely one of our early houses could be built," he adds, "but they are still good Troppo houses: so is there something wrong with them, or something wrong with the code? The code makes an assumption that everything will be heated or cooled, whereas some people can be comfortable without either."

Welke says that Troppo has been forced to work more closely with certifiers to ensure its current designs conform to the code, but as a result, "every project is an argument and a battle to get over the line".

Harris asserts that building code rules should be relaxed to allow people to live simply, and with less, if they choose to. "Because air conditioning exists, if people want to pay for that equipment, and the cost of running it, so be it, but there is a cost to all of us for that choice in the long term," he says. "The code should more seriously promote solar passive design, and provide an advantage for those people who seek to employ it.

"That would result in buildings that are a lot more dynamic: able to open up with shutters and blinds or, in the case of Darwin, the ultimate tropical house has no walls at all," he says. "If people want to live in the bush, in a shed, with a possum-skin coat in winter and a singlet and stubbies in summer, those people who are happy to live with less should be rewarded, but they are heavily penalised at present."

When asked how Troppo manages to get around the myriad and often conflicting requirements, and what they have learned over three decades of practice that young architects may not yet know – he responds with a laugh that "the Troppo approach is to be devious, yet legal". SP

ON THE WATERFRONT

It is not quite a case of turning a sow's ear into a silk purse, but the re-invention of this degraded industrial waterfront site in Hobart is a remarkable transformation.

Words **Paul McGillick** Photography **Ben Hosking; Paul Bradshaw**

ARCHITECT
Room 11

PROJECT
Glenorchy Art and Sculpture Park (GASP), Stage 2

LOCATION
Glenorchy, Tasmania

The opening of the Museum of Old and New Art (MONA) in Hobart four years ago has reportedly seen tourist numbers in Tasmania increase by over two million. This has engendered the idea that the island state, with its undernourished economy, could become a cultural destination; a parallel to the way Frank Gehry's Guggenheim reinvigorated the otherwise unprepossessing industrial port city of Bilbao in Spain.

The completion of Stage 1 of the Tasmanian Museum and Art Gallery in Hobart and the success of the two-year-old Hobart Baroque Festival (of which MONA is a partner) suggests that there is indeed a new cultural dawn taking place.

Now the completion of Stage 2 of Glenorchy Art and Sculpture Park (GASP), directly across Montrose Bay from MONA, gives further credence to the proposition that Hobart is becoming a cultural destination. But if MONA is international in its aspirations, GASP is explicitly local: it is very much about its place.

Yet, from the beginning – driven by GASP CEO and Glenorchy City Council project officer Pippa Dixon – GASP was always going to complement MONA. Like MONA, the new GASP pavilion is served by a new ferry terminal. But whereas MONA is a very subterranean experience, GASP is all about the landscape, the river and the embracing mountains to the east and west.

It is about the broad, arcing expanse of the bay and its foreshore, and the vista which visitors see on arrival at the park gates, with the pavilion a distant destination. In fact, for those who come on foot – the walkers, joggers and cyclists – this is very much a sequence of arrival, with a growing sense of expectation: ultimately fulfilled by the pavilion and its semi-exposed courtyard.

Architects, Room 11, worked on Stage 1 which involved the landscaping: defining the foreshore and constructing a steel-framed pedestrian bridge to curve around its edge, and re-vegetation. Lead architect on the project, Thomas Bailey, does not speak so much of architecture, but of providing the infrastructure to facilitate Pippa Dixon's vision. The infrastructure, he says, was to be done in an "artful way" to reflect the purpose of the park which was to host permanent sculptures, temporary installations and events.

Stage 2 was to provide a sheltered space with a barbeque area and the flexibility to accommodate a pop-up café – hence, the steel bollards for power and light. For this stage, Room 11 worked with landscape architects McGregor Coxall, a firm

PANEL SAYS

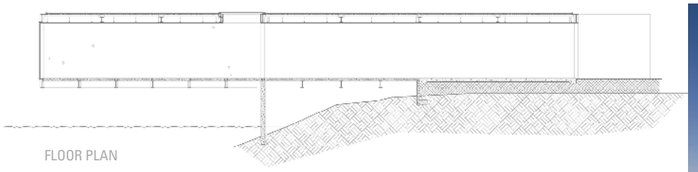
This sublime project in Hobart could not have been realised without the use of steel to carry the cantilevered structure out over the bay. As a community pavilion, this project is bold and subtle in equal measure, at once containing and reaching out to the landscape. According to one of our panelists who has visited the project, the experience of being there is far superior to perusing the project images, which are themselves uplifting and inspirational. "Outside, you feel the cold wind, so when you go inside, you think: 'This place is perfect'," he said. "It's the ultimate flexible space for events and provides a bookend to Hobart's world renowned new arts precinct."

ABOVE: The pavilion provides both refuge and prospect, a shelter from the wind, but with multiple views out

TOP RIGHT: Looking down the pavilion the river view is framed against a dramatic reveal of Mount Direction

CENTRE RIGHT: Whichever way one looks there is an intriguing assembly of sculptural forms

BOTTOM RIGHT: Looking across the courtyard to the toilet block



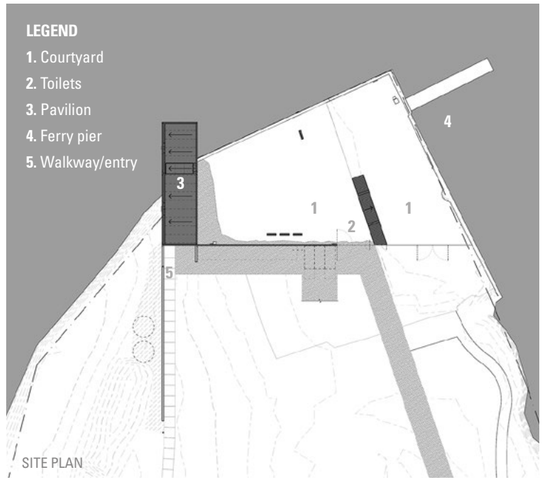
FLOOR PLAN

TOP LEFT: The industrial aesthetic is continued with the materials of the toilet block

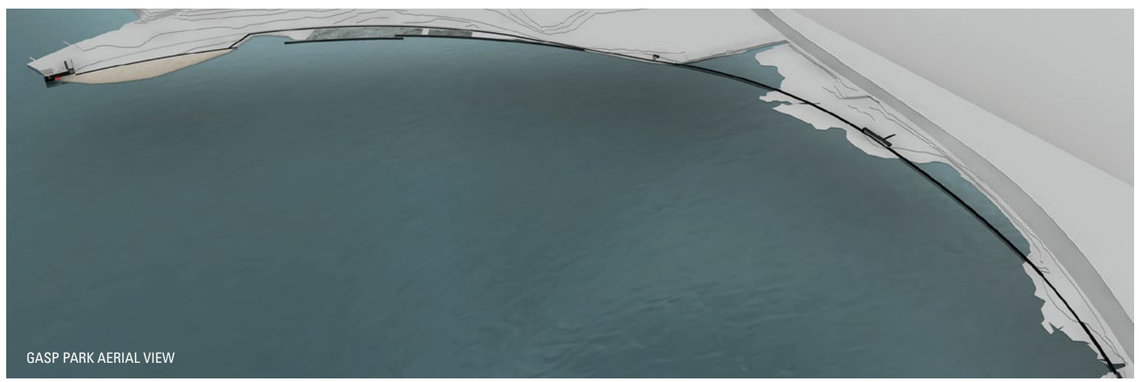
TOP RIGHT: The building celebrates its concrete and steel construction

ABOVE: The cantilever seen from below looking towards Mount Direction

OPPOSITE: Engagement with the site is supported by the reflective quality of the feature window



SITE PLAN



GASP PARK AERIAL VIEW

with experience working with recovered industrial sites. “The idea,” says Bailey, “was to take a remnant site and give it some energy and potency”.

The site of the pavilion is on Wilkinsons Point where the Derwent River kinks around, offering views back towards Hobart, across the river to Mount Direction, further up the river and across Montrose Bay along the foreshore towards Glenorchy and MONA.

Near the ferry terminal there is a plaque which refers back to the 1975 disaster when a bulk iron ore carrier accidentally rammed into the Tasman Bridge. The Bowen Bridge, north of the Tasman, was built between 1980 and 1984 as insurance against any such future accidents, and the GASP site is where 86 metre-long steel girders were constructed, to be ferried up the Derwent to the Bowen Bridge site.

The pavilion precinct repurposes the remnant industrial concrete apron, retaining its character while still providing the amenity required. At the same time it adds another layer of history to the site. “The drive,” says Bailey, “was to create a relationship with the topography and use the infrastructure to promote an understanding of that reading of the place.”

The result is a fascinating diversity of orientation where the spectacularly rich landscape and marinescape is brought into focus by various framing gestures. This is supported by an equally intriguing counterpoint of materials and textures. Here the use of steel plays a key role because it engages in a dialogue with the concrete which ranges from the raw industrial to the smoothly finished – sometimes mixed, as with the outdoor seats which are concrete piers (with polished tops) recovered from the bay.

Ultimately, the pavilion is highly sophisticated in an understated way. The constraint of the industrial heritage was seen as an opportunity, as was the very small budget (comparable with the cost of building a waterside house in Sydney, according to Bailey) and the tight three-month turnaround from commission to completed documentation.

The approach is along the curving walkway, across a multi-coloured, steel-framed pedestrian bridge set on a concrete retaining wall, and past a 40 metre-long, 600mm-thick finished concrete wall which shelters visitors from the chilly westerly winds that sweep across the bay from Mount Wellington. The visitor then enters the sheltered space of the pavilion along a feature window looking westwards. The glass is red, but appears purply-pink because of the colour of the sky. The colour is deliberately warm in what is often a very cold place. But, says Bailey, “we liked the idea of looking through the glass towards MONA. Red is a charged colour. It is a bit cheeky and playful.”

The climax of this sequence of arrival is the 12 metre-long, eight-metre-wide cantilever stretching out over the water with its framed view looking north – “a real celebration of what we can do structurally with steel,” says Bailey, who describes the cantilever as a strong, final gesture.

Whereas the courtyard is oriented towards Mount Direction, the cantilever provides a relationship with the water. To create such a bold cantilever, says Bailey, there were only two options: either concrete or steel. This is a combination of the two – “a nice, efficient way of achieving the gesture we were after,” he says.

C purlins made from GALVASPAN® steel act as a steel tie with “a gargantuan amount of concrete and piling underneath”. The wall is the bracing panel which pins the cantilever to that huge footing. The cantilever is effectively hung from the top, from the purlins.

“We originally tried to pin the structure into rock with a particular type of anchor, which didn’t work. Then we basically went for mass; for sheer weight to hold it up. It’s all tied with piles.”

Bailey says that it would not have been possible to make the structure without using steel. He describes it as “a pretty courageous piece of engineering” and he credits structural engineer, Jim Gandy, for pulling it off.

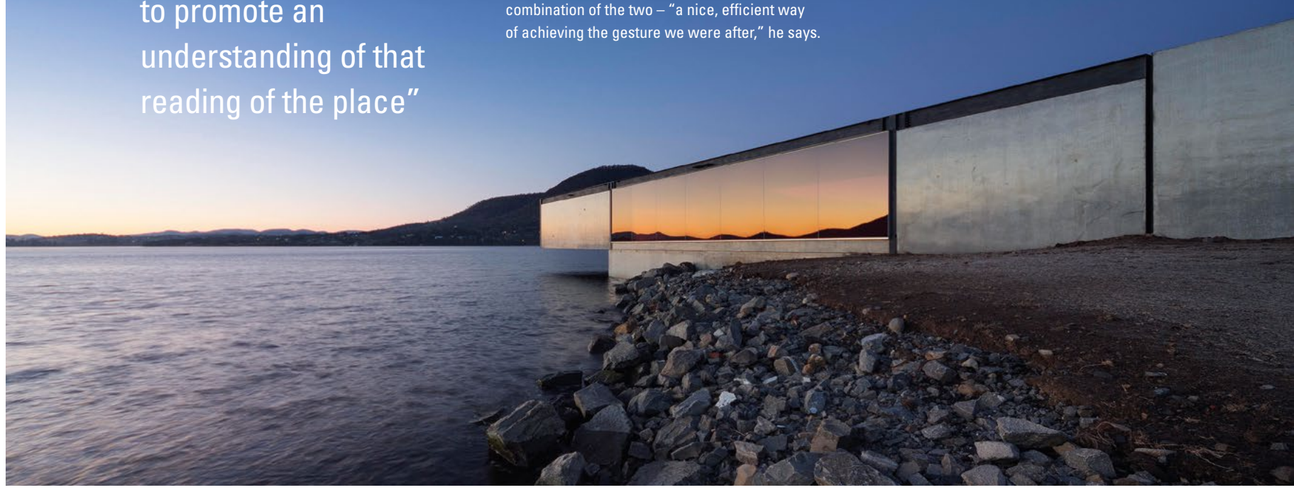
The steel, then, is essential to the structural solution. But aesthetically it forms a dialogue with the various forms of concrete. This dialogue is continued with the thin custom-folded tray roofing using C purlins and COLORBOND® Ultra steel. Although only the ribbing is visible, the decision to customise the roofing was about being cost effective and vandal-proof. Working something out from scratch like this, says Bailey, is always more complex than simply specifying an off-the-shelf product, but the result is more satisfying.

Inside, the ceiling is customised 316 stainless steel sheeting on villaboard whose reflective property projects the constantly changing external light and colour on to the interior of the pavilion.

Summing up Room 11’s approach to the selection and use of materials, Bailey comments: “Using industrial standard products in an interesting and innovative way is what good design should be.”

Its proximity to MONA suggests a quickening cultural dynamic which may well shift our picture of Tasmania from being a producer of timber products to being a cultural destination marked by a unique and rapidly maturing architectural tradition. **SP**

> “The drive was to create a relationship with the topography and use the infrastructure to promote an understanding of that reading of the place”



PROJECT Glenorchy Art and Sculpture Park (GASP), Stage 2 **CLIENT** Glenorchy City Council **ARCHITECT** Room 11 **PROJECT TEAM** Thomas Bailey (lead architect), Josh Fitzgerald, Megan Baynes, James Wilson, Nathan Crump, Georgie Wettenhall (Design Flow) **STRUCTURAL & CIVIL ENGINEER** Gandy and Roberts **BUILDER** Fairbrother **STEEL FABRICATOR** Fame Foley, Derwent Valley Engineering **SHOP DRAWING CONTRACTOR** Fame Foley Duggans **CONCRETE CONTRACTOR** Duggans **LANDSCAPE ARCHITECTS** Mark Haycox (McGregor Coxall) in collaboration with Room 11 **PRINCIPAL STEEL COMPONENTS** Custom-folded roof made from COLORBOND® Ultra steel, supplied by The Roofing Centre and assembled on site by Fairbrother Pty Ltd; C purlins made from GALVASPAN® steel **PROJECT TIMEFRAME** 12 months **AWARDS** GASP 1 received Urban Design Awards at the Australian Institute of Architects Tasmanian Chapter and National Architecture Awards in 2013. GASP 2 received the Dirk Bolt Award for Urban Design at the 2014 Tasmanian Chapter Australian Institute of Architects Awards **BUILDING SIZE** 300m² (internal). Entire site is 800 metres long **TOTAL PROJECT COST** (including landscape works): $2.4 million

PBB

HEROIC GESTURE

The new AGL Lakeside Pavilion at Mount Annan shares more than a passing similarity with great English garden follies.

Words **Rachael Bernstone** Photography **Peter Bennetts (PBB); Paul Bradshaw (PMB)**

ARCHITECT
Kennedy Associates

PROJECT
AGL Lakeside Pavilion

LOCATION
Mt Annan, NSW

PBB

One of the great delights of visiting majestic landscaped parks and gardens – especially in England – is the discovery of a folly, a romantic building in the shape of a rotunda or tower. Made famous by 18th century landscape designer Lancelot 'Capability' Brown, follies enhance one's enjoyment of the garden by improving vistas thanks to their careful placement among sculpted rolling hills and serpentine lakes.

While the tradition of placing follies in gardens didn't translate readily to Australia, a new structure at the Australian Botanic Garden, Mount Annan, calls to mind those early garden ornaments. Sited on a rise overlooking two lakes, it commands superlative views across a vast sweep of the grounds and proclaims its presence in the landscape. From a distance, and on approach, it reads like a temple, thanks to the slender steel columns that reach upwards past the roofline, like an ancient Greek ruin.

The building is the AGL Lakeside Pavilion, and it heralds a new direction for the Garden, which was first mooted in 1984 and opened as a bicentenary project in 1988. Early buildings – co-located at the centre of the 416-hectare site, including visitor amenities, a café and garden shop – were bland and generic, some were demountables.

"The earliest structures in the garden didn't really have a strong identity," says Kennedy Associates director Anthony Nolan. "But as the garden has matured it has developed a unique identity as an important botanical and cultural precinct in south western Sydney, and the new buildings are really important expression of that identity."

> "Even though there is an incredibly rigorous geometry – which includes a double ridge in the roofline so that the building presents faces on multiple sides – there is a sense of quirkiness, too"

Nolan should know: he designed the Garden's first permanent building – the Bowden Centre, which opened in 2007 and won the Sulman Award that year. Praised by the jury as a "simple, elegant and intelligent building", it was built on the site of a former demountable and constructed with some recycled materials.

"The Bowden Centre was originally designed as an educational facility but after completion it very quickly turned into being used for weddings and events," Nolan says. "So in a sense, the new Pavilion is a companion piece to it, because it's the outdoor events facility."

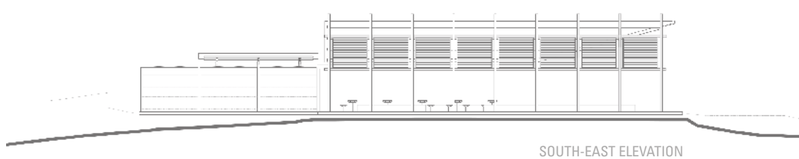
In recent years, Nolan and his fellow director Steve Kennedy have both noticed a touch of eighteenth-century English landscape architect, 'Capability' Brown, creeping into the Garden. "Capability Brown was known for saying: 'That hill is in the way, we'll move it'," Kennedy says. Of course, some things can't be moved and some things are botanically really important, but the client has different priorities for different plants.

"We noticed that the landscape varied quite considerably at times during this project, when entire sections of garden would just disappear overnight, always to good effect and for good reason," Nolan adds. "The garden is far from static as plants reach maturity and are replaced, priorities change and garden beds are reshaped. During the early stages, every tree felt sacred, but we now have a realisation that – as an Australian native garden – some of the plants are representational but not rare, and some will regrow within five years, so they can be replaced. For that reason, it's a good time to be working in the Garden."

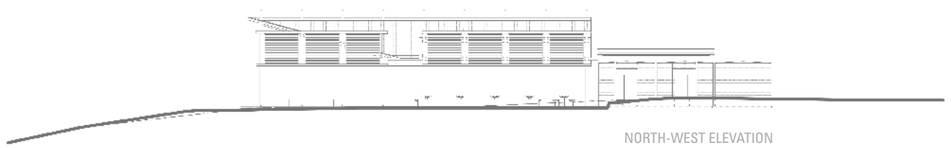
Another building that explores the unique identity of the Garden is the recently completed PlantBank, designed by BVN Donovan Hill and completed in mid-2013 to mark the Garden's 25th anniversary. It accommodates Garden staff and researchers and occupies a prominent site overlooking the main entry drive, and it won an Architecture Award at the Australian Institute of Architects' New South Wales Chapter Awards this year.

ABOVE: The use of structural steel framing allowed the architects to eliminate cross-bracing at ground level, thereby maximising connections between the pavilion and garden's landscape

BELOW: The double ridge in the roof made from COLORBOND® steel gives the building multiple presentation faces, making it welcoming from all directions



SOUTH-EAST ELEVATION



NORTH-WEST ELEVATION

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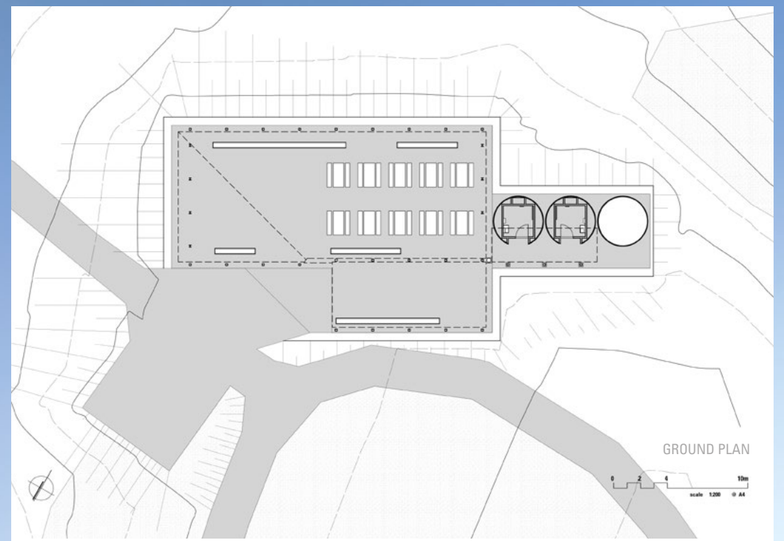


Whereas PlantBank is a research facility and therefore closed to the public, the AGL Lakeside Pavilion was always intended to welcome everyone. It's the largest of a suite of new facilities designed by Kennedy Associates – including picnic shelters and public toilets – and it shares a similar aesthetic with them, and the Bowden Centre.

That similarity arose from an unlikely source: telegraph poles. The Garden was given a large stockpile of recycled poles, which have been used to construct many of its buildings.

Despite these strong timber influences, and after much deliberation, Nolan opted to construct the entire Pavilion using steel, choosing the material for its crisp detailing, lightweight strength, speed of erection, and to minimise the number of trades on site. "One of the remarkable things about building with steel is that once the base is done, there's a structure there and it's often very dramatic," Kennedy says. "In this case, there was just one week of steel work required on site."

"Another reason for choosing steel was that it required no bracing, so there are no barriers to entry at ground level – nothing to impede access from all four sides – which allows the building to engage more fully with the Garden," Nolan adds. "To do all of those connections in timber would have been a monstrous job at this scale, and would have resulted in a very different building with enclosure around the lower level."

While the use of steel gives the building an honest, almost agricultural aesthetic, the exceptional geometry means it transcends rudimentary farm buildings. The complexity of the steel structure was born of trial and error in the design phase, with Nolan discarding many iterations along the way. Recalling that lengthy and arduous process, Kennedy says it helped to reveal and nurture the building's own willful character.

"This is a raw muscular shed, where nothing is hidden, nothing is covered and nothing is painted, yet there is an allowance for the structure to do what it needs to do," he says. "Even though there is an incredibly rigorous geometry – which includes a double ridge in the roofline so that the building presents faces on multiple sides – there is a sense of quirkiness, too.

"In one sense the building is very geometrical, very symmetrical and very formal, and yet at the same time the structure is just doing what it wants to do," Kennedy continues. "We allowed those two approaches to crash together and talk to each other, such as where the perforated screen meets the roof at the entrance verandah."

The time spent refining the design helped to ensure the building was inexpensive to construct, Nolan says. "In the interests of economy we set ourselves an agenda of reducing any duplication, so that if two things were near each other and they could do the same job, we would combine them," he explains. "For example, some of the column lines shift and step sideways, which allowed a beam to do its job. We've made a virtue of that quality throughout the design by exposing it all, and letting the building dictate to us where we could put things."

Like Capability Brown's follies, this building was designed to be approached from all four directions, although the 'verandah' on the north-western edge doubles as a welcoming entry portal and the best location for a bar at a formal catered event. Nolan originally set out the building around the dimensions of a 200-person marquee, and the ghost of a tent-like structure can be read in its slender steel 150mm SHS columns and 200mm UB Roof Beams covered with a thin and lightweight roof. Nolan specified Ritek Ecotek™ Roof Panel 130mm made from COLORBOND® steel, in the colour Bushland® on both sides, for the roof.

"The edges of the roof are thin and they cantilever away from the structural steel frame, and we couldn't have achieved that cantilever with any other material of that thinness without a lot of extra structural support," Nolan says. "If you

"One of the remarkable things about building with steel is that once the base is done, there's a structure there and it's often very dramatic. In this case, there was just one week of steel work required on site"

Kennedy says the building has a unique and deliberate presence, similar to the Acropolis in Athens or a praying mantis climbing over the hill

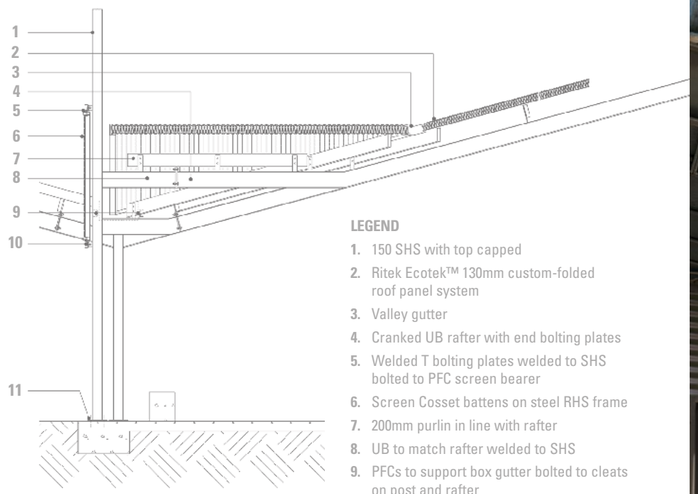

PBB


PMB

ABOVE: In design stage, the building asserted its own wilful determination, and the architects allowed some disparate elements to "crash together", such as where the perforated screen meets the metal roof at the entrance verandah

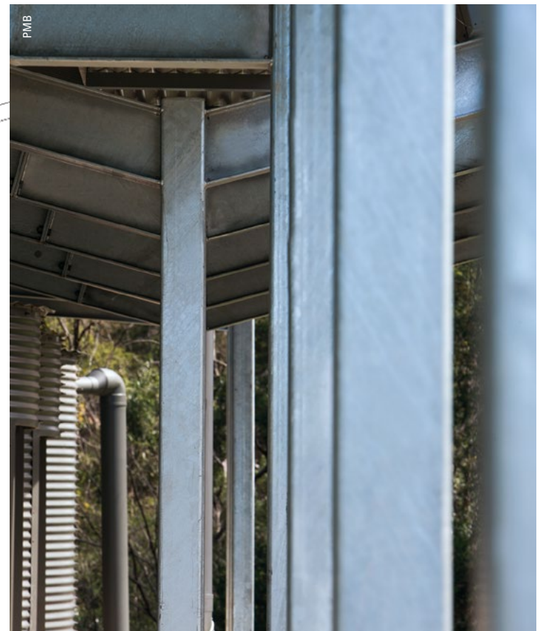
LEFT: The exposed box gutter is one of the building's detailing triumphs, according to Anthony Nolan

BELOW: Another example of design economy clashing with the building's wilfulness can be seen in the row of columns that steps to one side, which reduces duplication in the beam overhead



LEGEND

1. 150 SHS with top capped
2. Ritek Ecotek™ 130mm custom-folded roof panel system
3. Valley gutter
4. Cranked UB rafter with end bolting plates
5. Welded T bolting plates welded to SHS bolted to PFC screen bearer
6. Screen Cosset battens on steel RHS frame
7. 200mm purlin in line with rafter
8. UB to match rafter welded to SHS
9. PFCs to support box gutter bolted to cleats on post and rafter
10. Welded T bolting plate welded to SHS bolt to PFC screen bearer
11. Welded base plate bolted to slab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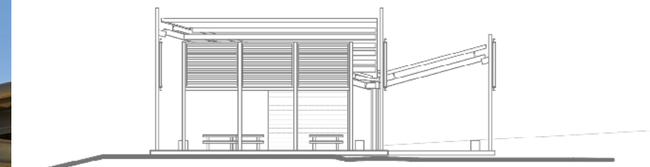
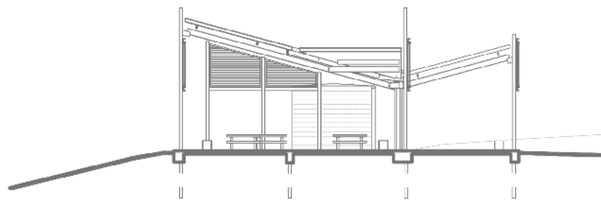

NORTH-EAST ELEVATION


CROSS SECTION

compare the thickness of the edge of the roof here to the roof on the Bowden Centre, we would have lost the sense of delicacy and the serrations on the Pavilion if we had used any other product."

A box gutter runs through the centre of the building collecting water for storage in the adjacent 'tanks' – also clad in LYSAGHT CUSTOM ORB® profile made from COLORBOND® steel in the colour Woodland Grey® (two contain toilets, one holds water). Made from COLORBOND® steel and completely exposed underneath, the box gutter exemplifies the project's exquisite detailing of modest materials.

"I'm quite proud of the box gutter because it is completely exposed, every piece of it including the purlins and beams that support it is exposed," Nolan says. "I was expecting to go on site and find it dressed up, but it's not, and it doesn't look out of place. That's been one of the triumphs: the detailing is so robust that the agricultural character of that gutter is not out of place."

Both Kennedy and Nolan are full of praise for the construction team that brought their vision to life. "The builder and steel fabricator were excellent; everything is crisp and how we wanted it to be," Kennedy says.

"They produced 34 steel fabrication drawings after I had developed the design extensively in 3D and CAD – that was the only way we could strip the structure back as we've done, and accept those various kinks – so when the fabricator did a drawing that looked similar to mine, I thought: 'Great, we are on the same page'," Nolan adds.

Kennedy marvels at the building's impressive appearance, which was apparent in the drawings and CAD models, but even more so in reality. "When Anthony brought back the first photo of the building as it was going up, I thought of the Acropolis [in Athens]: it's got that heroic quality," he says. "That was absolutely what we set out to do. I referred to the building as a praying mantis climbing over the hill towards you, it was meant to draw your attention and take you up there."

"The builder and steel fabricator were excellent; everything is crisp and how we wanted it to be"

The building is used as part of the Garden's formal events program – which includes outdoor movie nights, Christmas carols and weddings – and regular day-trippers have also embraced it.

"There are other picnic shelters that are far easier to get to than this one, but they don't have the outlook," Nolan says. "And once you are at the Pavilion, you want re-engage with the garden, so there are no enclosing walls, and the sightlines are compressed down to draw your attention outwards. We've noticed that people tend to gravitate to the northern end: it's a comfortable place to sit, the building's gentle edge."

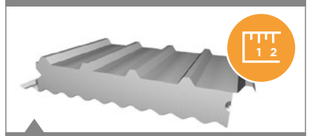
As a building, the Pavilion shares some attributes with follies – it's aesthetically very pleasing, and its majestic presence improves vistas from all directions – but it is functional as well. Where most follies served little practical purpose, the Pavilion provides a welcoming place to sit and socialise, with the added benefit of being able to enjoy expansive views of the sculpted landscape from within its sheltered enclosure.

"Even though there is a degree of difficulty, people are making the effort to use the Pavilion," Kennedy says. "Before it was built, there was no reason to go up there, so there was a sense of: 'Build it and they will come'. To be fair to the Garden, it was a big punt to build a structure up there, so to see it so widely embraced is fantastic." SP

PANEL SAYS

This pavilion is exceptionally well sited in the rolling botanic gardens landscape, both aesthetically and for environmental performance. From its vantage point on the brow of a hill overlooking two lakes, it provides a room-like space for picnickers and event-goers to gather, combining protection from the elements with permeability in the landscape and access to views. The regular structure, with its steel columns and beams simply bolted together, derives from honest and raw materials, but its rawness is enhanced by considered details such as the slatted upper screens and the gentle upwards tilt of the roofline on the northern corner. These elements allow winter sun to penetrate deeply into the space while keeping summer sun out. Undeniably modest yet intelligently executed, the pavilion is a welcome addition to the Mt Annan Botanic Gardens


View a video of the architect and builder discussing this project at **steel.com.au/steelprofile**



Ritek Ecotek™

CAD files, textures, technical drawings and product brochures are available at **steel.com.au/steelprofile**

PROJECT AGL Lakeside Pavilion **CLIENT** The Australian Botanic Garden, Mount Annan **ARCHITECT** Kennedy Associates **PROJECT TEAM** Anthony Nolan, Steve Kennedy, Alisha Menezes, Vanessa Alves dos Santos, Trinity Woo, Christina Krane, Kris Schubertd **STRUCTURAL & CIVIL ENGINEER** Cardno **BUILDER** Zadro Constructions **STEEL FABRICATOR** BRH Steel Constructions **SHOP DRAWING CONTRACTOR** BRH Steel Constructions **STEEL DISTRIBUTORS** CMC, All Metal Roofing, Steel Roofing Supply Centre **COATINGS** Hunter Galvanising **METAL BUILDING CONTRACTOR** Bay and Coast Metal **LANDSCAPE ARCHITECTS** The Australian Botanic Garden **PRINCIPAL STEEL COMPONENTS** Roofing: Ritek Ecotek™ Roof Panel 130mm custom rolled from COLORBOND® steel in the colour Bushland®. Toilets and tank: LYSAGHT CUSTOM ORB® profile made from COLORBOND® steel in the colour Bushland®. Flashings: COLORBOND® steel in the colour Bushland® custom folded at All Metal Roofing in Unanderra. Box Gutters: COLORBOND® steel in the colour Bushland® custom rolled at Steel Roofing Supply Centre in Sydney. Structural steel: Columns: 150 x 150 x 5 SHS, 150UB18, 150 x 150 x 6 SHS. Beams: 200 PFC, 250UB25, 250UB37 (Cranked), 250UB37, 250UB25, 100PFC, 200UB25 **PROJECT TIMEFRAME** Three months to design, two months to document, about four months to build **AWARDS** 2014 Australian Steel Institute National Steel Excellence Award, Buildings – Small Project. WAF 2014 – Shortlisted in Civic and Community category **BUILDING SIZE** 350m² **TOTAL PROJECT COST** $650,000

READY-SET

Lacking an Olympic timeframe or funding, the design of this new sports venue steers clear of the exaggerated theatrics of many recent stadia, and the result is no less thrilling.

Words **Micky Pinkerton** Photography **Alison Paine**

ARCHITECT
Cox Howlet & Bailey Woodland

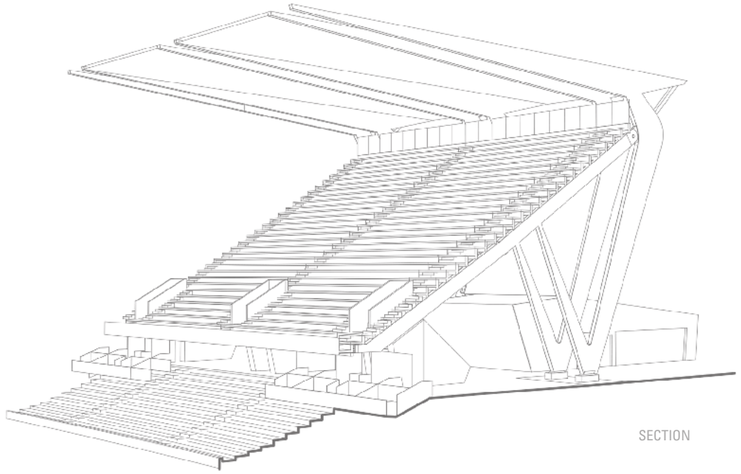
PROJECT
Perth Rectangular Stadium Stage 1 Redevelopment

LOCATION
Perth, Western Australia

It was perhaps more an evolution than a revolution but at some point in the past decade the professional sporting industry went from super to mega in character. The eight-figure salary was passed over for nine, TV rights were negotiated in the billions rather than the millions, and players started wearing fabrics made in laboratories that made them look like they had stepped straight from a Marvel comic.

Needless to say this mega world demanded architecture to match; another fantastical element to remind the mere mortals passing through the turnstiles that they were about to enter a world of heroes and gods. And the design profession did not hold back: we've seen bird's nests in Beijing, spotty spaceships in Belarus and inflatable boats in Bavaria.

With so much craziness on field and off, it is wholly refreshing to come across a recent example of the contemporary stadia typology by Cox Howlett & Bailey Woodland which eschews mega in favour of a more subtle approach.



SECTION

The stadium is the new home of the Perth Glory football and Western Force rugby teams, and by dint of the shape of the field those sports are played on, the venue has become known as Perth Rectangular Stadium.

The structure of the new eastern and southern grandstands deliberately responds to that shape in an orthogonal manner. However, in section, the skeletal frames are sculptural and organic, producing an absorbing compound geometry through the steelwork. The effect is disarming – while the stands look fairly typical in form from the playing field, the spectators' approach to the stadium through the adjacent parklands is an altogether more curious visual experience.

A series of tapered and shaped steel frames support the roof and the seating, and create a generous concourse. To the naked eye these frames, made from hot-rolled sections of BlueScope steel, look like enormous boomerangs. In section they could be an army of praying mantises poised to pounce, or a flock of cranes about to take flight. Architect Steve Woodland's visual reading is perhaps more on message, given the project's main purpose.

"The shaping of the steel almost takes an athletic stance," says Woodland. "It has a muscular quality to it, like someone ready to sprint. We were seeking to achieve a sense of the dynamic in the structure, rather than just a simple steel assembly, and we wanted the steelwork to become a sculptural piece in its own right. So there was a gridded response to the rectangular form of the pitch, but then in section there's a very organic shaping of the steelwork: firstly to respond to its structural needs in generating a single major cantilever, and secondly in the dynamic look of 'legs' on the ground."

The motif of a sprinter has further meaning for the project – the brief stipulated an extremely tight nine-month program to have the stadium substantially delivered between sporting seasons. That ruled out major in situ concrete work, or a design dependent on separate elements of the building being produced in succession. Woodland drew on the practice's past experience of public projects with punishing timelines, and in particular its legacy of rail projects which used skeletal steel-framed buildings in order to construct new stations quickly on active sites.

"We needed to have the components manufactured in parallel, not in sequence," says Woodland. "So all the large frames were effectively manufactured off-site and brought to site and assembled as a kit. The assembly process was very important and certainly informed the design concept in the first place, and it meant that while ground works were being done the structure could progress as a separate stream of activity."

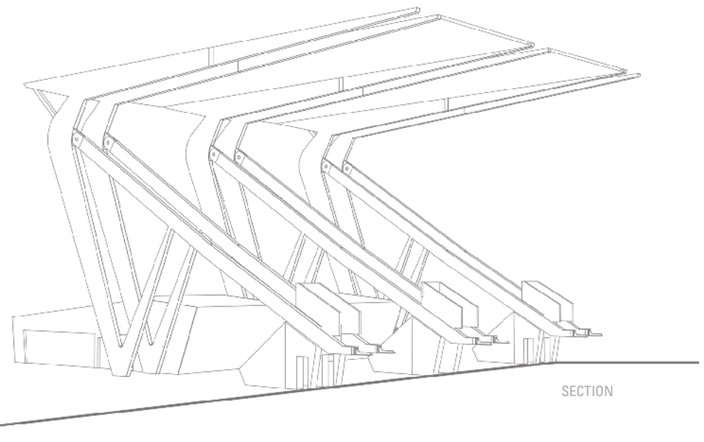
Just how quickly the structure was erected is shown in a timelapse video on the client's website and steel.com.au/steelprofile. The first third of the film shows ground works before a crane arrives on site, and suddenly the skeletal frame goes up in a matter of days.

Pre-fabrication of the steel elements had further advantages for Woodland in that the quality of the finish that can be achieved in a workshop is substantially greater than what can be achieved on site. However, it also brought with it challenges in terms of planning and execution.

"When things are component-driven and factory-made you can achieve a lot of things in a complex and high-finished-way but you then have to be particularly careful that the assembly on site is as simple as possible… It's a very different circumstance from unfinished steel work, where if something doesn't quite fit you hit it with a hammer and force it into place.

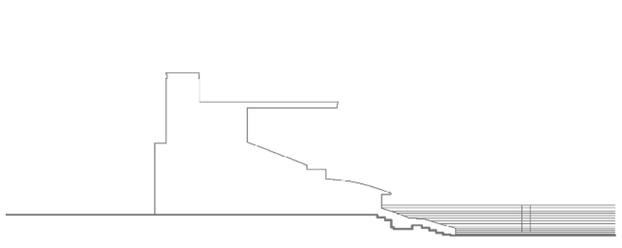
"That's OK when it's put up in a roof space and no-one is going to see it, but it's a long way from what we were seeking to achieve here where the steel work is not only structure, but it is also a finished piece of architecture. So the joints and assembly have to occur in a manner where it's all sleeving together, in a guided and organised manner and without too much complexity, to still create a beautiful joint."

"The shaping of the steel almost takes an athletic stance. It has a muscular quality to it, like someone ready to sprint"



SECTION

A series of tapered frames made from hot-rolled steel provide uninterrupted sightlines for spectators as well as a generous concourse underneath the stadium's seating



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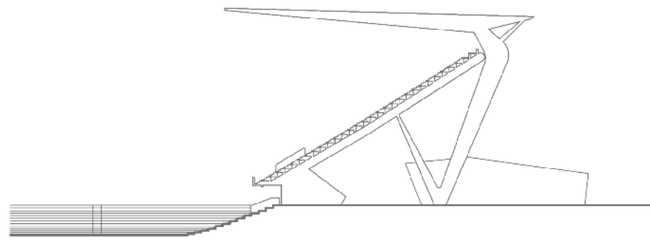


ABOVE: Woven metal mesh is stretched between each of the skeletal frames, allowing natural light to penetrate while protecting the concourse from wind and rain

BELOW: Support amenities and serviced areas are located under the seating, pulled into pods on the outer edge of the concourse to enable views back to the park

The project therefore demanded an even greater collaborative design and construction process than usual. Woodland and his team invested a lot of time working with the fabricators to plan the production and delivery of the columns and rafters to site with as little movement of the components as possible, to avoid damage to the finished item.

With the columns weighing 25 tonnes, being 30 metres in length and fabricated in one piece from milled stock, that task might have seemed gargantuan, but for Rohan Eicke of Phillips Engineering the scale of the project was no problem. The company works predominantly on large industrial projects, from mining conveyors and off-shore rigs to modifications to heavy-lift ships. However, with a high spec, three-coat finish to the rectangular stadium's rafters and columns, moving items via the usual method of hooks and chains had to be reconsidered and an alternative developed with the architect.

"We actually ended up screwing a lifting eye into it so we didn't chain up around the unit, which would have destroyed the paint," says Eicke. "The lifting eyes were screwed into the ends of the column, which was then raised up. Then it was unscrewed back out and that little thread area was plugged, with no damage to the paint. We also had to fabricate the units in such a way so that they were in the correct position, so they didn't need to be turned, which would have also risked damaging the finish."

Eicke and his team have since applied the skills learned on Perth Rectangular Stadium to other projects. With many conveyor components weighing up to 80 tonnes and exceeding the capacity of the

"The large frames were off-site manufactured and brought to site and assembled as a kit… while ground works were being done the structure could be progressing as a separate stream of activity"

company's overhead crane, Phillips Engineering is now planning fabrication to reduce component movement, to the point where pieces can just be jacked up and hoisted off trucks into their final resting positions without the need for rotating at any stage.

The knowledge transfer between architect and fabricator flowed both ways. The initial design had not fully appreciated the welding requirements for fabrication and the accessibility needed to be able to weld the internal stiffening for the columns and rafters. Eicke produced a mock-up, tack-welding one column to one rafter to physically show the difficulties he foresaw with welding the columns out, which led to the project team workshopping possible solutions and a subtle redesign.

Relatively new to architectural work, the fabricators enjoyed the project and – despite the tight schedule – report that it was one of the happiest sites they have worked on, where the group sense of achievement in the outcome was always evident.

Woodland concurs. "Having those conversations with the fabricator, the contractor and the transport guys early on meant that everyone worked well together… When there's a good team spirit and when people understand what you are trying to achieve they do things with care and get pride out of it as well."

Woodland's other key take-out from the project is the flexibility provided by the hot-rolled steel to create shapes.

"The product was perfectly suited to being able to sculpt and shape those steel frames," he says.

"I think it's a dimension of steel work that sometimes gets lost, that the fluidity of being able to work with that material means you're not bound by the extruded shape in that sense; it can be almost hand-sculpted as well as respond efficiently to the structure. That is one of the great successes of the project and offers a great amount of potential going forward."

That dimension did not go unnoticed during the WA Chapter Australian Institute of Architects awards, with the project winning the COLORBOND® Award for Steel Architecture. The jury acknowledged the lightness of structure and elemental elegance enabled by the use of steel: "The repetitive placement of the tapered steel buttresses, articulation of the roof modules via the insertion of glass strips and the connection of all components with comparatively slender steel connectors resulted in a large structure that ended up visually light."

The new stands have been equally well received by the client, the two professional teams using the stadium and their fans, who have praised the extensive sightlines and the improvements to the spectator experience. Rob Didcoe, director of facilities and camps for the Department of Sport and Recreation, is delighted by the awards the project has won.

"As the client, it is pleasing to have the entire project team recognised for the quality of the work that went into the planning, design and construction of the stadium upgrades," says Didcoe."More importantly, the end result is an innovative, quality elite sport and entertainment venue that will serve the needs of the WA community for decades to come." SP

PANEL SAYS

There is a real clarity in the way steel has been used to construct this stadium. From the bracing that carries the raked seating, to roof supports – it's all incredibly well integrated. The logic and rhythm of the design concept is clearly legible in the sketches and carries through to the built form, which juxtaposes a poetic tension between lightness and prospect, and feeling grounded and secure. The clever handling of the steelwork means there are no ties in the structure, thereby providing uninterrupted views from every seat. The spectator experience is dramatically improved by the crafted and sensitive use of steel

PROJECT Perth Rectangular Stadium Stage 1 Redevelopment **CLIENT** Building Management & Works on behalf of Department of Sport & Recreation **ARCHITECT** Cox Howlett & Bailey Woodland **PROJECT TEAM** Steve Woodland, Greg Howlett, Alastair Richardson, Matthew Batchelor, Nigel Saull, Louise Buckingham, Christopher Foy, Meghan Chute, Brian Dennison, Graham French, Anna Hopkins, Patrick Ong, Renae Prisov, Jerome Monty **STRUCTURAL & CIVIL ENGINEER** Arup **BUILDER** BGC Construction **STEEL FABRICATOR** Phillips Engineering **SHOP DRAWING CONTRACTOR** CADstruction Drafting Service **CLADDING CONTRACTOR** JT Cladding **LANDSCAPE ARCHITECTS** Newforms Landscape Architecture **PRINCIPAL STEEL COMPONENTS** RHS angles; flat bar; mill plate ranging from 6mm up to 50mm end flanges. The hot rolled sections were provided by BlueScope and the steel plate used for the columns, beams and rafters made from BlueScope Steel **PROJECT TIMEFRAME** July 2011 – December 2013 **AWARDS** 2014 The COLORBOND® Award for Steel Architecture. 2014 Australian Institute of Architects Awards (WA Chapter) Commendation – Public Architecture **BUILDING SIZE** 28,859m² **TOTAL PROJECT COST** $95.4m

HOLE LOTTA LOVE

Driven to design a school in a Pilbara town that is inspiring and comfortable for students, and attractive to parents, T&Z architects has applied some deft architectural and artistic touches.

Words **Rob Gillam** Photography **Robert Frith**

Previously at the epicentre of a natural resources boom, the town of Karratha has had to diversify in the wake of that industry's economic braking. This is exemplified in the State Department of Education's desire to improve the perception and application of public education and was a cornerstone of T&Z Architects' brief when designing the second stage of Karratha Senior High School.

Balanced against the Pilbara region's undeniable rugged beauty is a sometimes unwelcome remoteness, sometimes merciless climate and propoerty prices some city-folk would baulk at.

Project architect and T&Z Architects director Brad Quartermaine says the region including the major town of Karratha struggles to retain population and that T&Z's design for the school was aimed at helping to stem that flow. "It's hard to keep people here so it's important for the community to have retention strategies for the population. We want parents to stay once kids reach school age, for kids to be educated here and to take jobs that keep them in the local economy.

"Our design was very much about creating an environment that staff and students want to remain in, and we think the building and touches such as the artwork greatly contribute to that."

The region's climate and natural surrounds had a strong hand in shaping the building's character and resulting usage.

The shading screens made from XLERPLATE® weathering steel are mindful of the earthen ground plane

"Its forms are a series of layers and planes, both in the roofing and walling. These were articulated using a range of different colours which we drew from the environment around the school, including rock formations and plants."

In addition to various BlueScope structural steel sections and studwork for framing, several types of roof, wall and soffit cladding made from COLORBOND® steel in LYSAGHT CUSTOM ORB® profile and LYSAGHT SPANDEK® profile feature throughout, including in the colours Bushland®, Windspray®, Ironstone® and Evening Haze®.

The architects have in places folded down the roof to meet the ground plane and peeled down the back corners of wall planes to avoid solid segments.

Offering further permeability are a series of sun shades that overhang generously deep walkways providing thoroughfare and gathering spaces protected from the often extreme summer temperatures.

The steel columns supporting the shading panels are angled in an abstract fashion, similar to the rarely perpendicular surrounding rock shards.

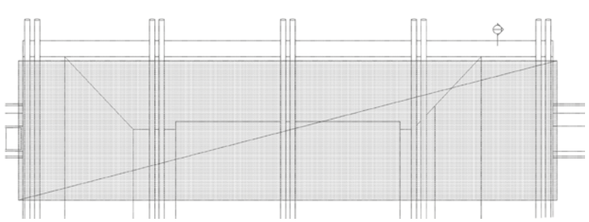
Mindful of the earthen ground plane, the architect specified that the sun shading screens be made from XLERPLATE® weathering steel, a material also chosen by artist Tim Macfarlane Reid to make free-standing sculptures that adorn the grounds.

Artist Rick Vermey was engaged to ensure the shade screens were both practical and emotive.

Like Quartermaine, Vermey drew on the landscape for the mural-style artwork's motifs. Pondering his favourite quality of the shade screen, he cites the constantly variable imagery cast by changing light and shadow.

"There are moments when you observe something completely afresh. You can chance upon some detail you've never noticed in a month of walking past it. I aspire to create experiences that linger in memory, or stimulate quiet contemplation. In this instance the hills, the rocks, the heat and the intense light directly contribute to the experience." **SP**

DRILL PATTERN



ELEVATION

PROJECT Karratha Senior High School – Stage 2 **CLIENT** Western Australia State Department of Education **ARCHITECT** T&Z Architects **PROJECT TEAM** Max Zuvela, Brad Quartermaine, Sinisa Stikic, Mark Karol, Graeme Abrahams, Linda Chiew **STRUCTURAL & CIVIL ENGINEER AND LANDSCAPE ARCHITECTS** AECOM **BUILDER** Pindan Contracting **STEEL FABRICATOR (BUILDING)** Italsteel **STEEL FABRICATOR (PERFORATED SHADING SCREENS)** Unique Metals **SHOP DRAWING CONTRACTOR** Ministruct Drafting **CLADDING CONTRACTOR** Jones Stone Roofing **PRINCIPAL STEEL COMPONENTS** Structure: BlueScope steel sections (various sizes/profiles), cold-formed steel studwork for framing; Cladding: Roofing made from COLORBOND® steel in LYSAGHT CUSTOM ORB® profile and LYSAGHT SPANDEK® profile in the colours Bushland®, Windspray® and Ironstone®. Walling made from COLORBOND® steel in LYSAGHT CUSTOM ORB® profile in the colours Bushland®, Windspray® and Ironstone® and Evening Haze®. External soffit linings made from COLORBOND® steel in LYSAGHT CUSTOM ORB® profile in the colour Evening Haze®; Artworks: Perforated shading screens and freestanding sculptures made from XLERPLATE® weathering steel **PROJECT TIMEFRAME** November 2011 to August 2013 (design & construction) **BUILDING SIZE** 8100m²

BLUESCOPE

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